



जम्मू केन्द्रीय विश्वविद्यालय
Central University of Jammu

राया-सुचानी (बगला), जिला: सांबा-181143, जम्मू (जम्मू और कश्मीर), भारत
Rahya-Suchani (Bagla), District- Samba, 181143, Jammu (Jammu and Kashmir), India

SEMESTER – X

Course Title: Microbiome

Credit: 4 (L-4, T-0, P-0)

Course code:

Contact Hrs/Week: 4 Hrs

Course outcome:

The course will provide knowledge about different microbes living in specific niche and their interaction with each other and other living organisms.

Learning outcome: Student will able to

1. Identify diverse microbial species inhabiting specific environments.
2. Analyse interrelationships among microbes and their impact on ecosystems.
3. Understand symbiotic and competitive interactions within microbial communities.
4. Evaluate the role of microbes in broader ecological processes.
5. Apply acquired knowledge to address environmental and health challenges effectively.

Unit I

Overview about Microbes: (bacteria, virus, fungi and protozoa which colonize human and animal body), Role of Microbiome in health of Human, Development of Microbiome in human from mother to child, Role of environment and lifestyle in development of microbiome.

Unit II

Microbial biodiversity and their function: Importance of the communities of microorganisms that inhabit the human body. Human Pathogens and their mechanism of disease establishment, Microbiome and Immunity and their role in protection from pathogens, Cross-Talk Between Gut Microbiome and Host metabolism under normal physiological condition.

Unit III

Mechanism of probiotics: enhancement of the epithelial barrier, increase adhesion to intestinal mucosa, and concomitant inhibition of pathogen adhesion, complete exclusion, production of antimicrobial substances. Modulation of immune system, Interaction of probiotics with the gut-associated immune system.

Unit IV

Human Microbiome: Gut Microbiome and their role in digestion and nutrition, Skin and Oral Microbiome, Microbiome in other human tissues, Microbiome and Diseases, Virome in Health and Diseases, Microbiome in Health and Diseases, Application of Microbiome in treatment of disease.

Unit V

Metagenomics and community profiling, metabolomics and its application, integrated microbiome and metabolome analysis, metabolomics-based approach to identify compounds affecting human health. Opportunities and challenges in nutritional genomics and metabolomics.

Suggested Literature: The course will be taught from papers published in "Nature, Science, Cell, Microbiome, Gut" and other journals.

26